33. Ampullaria, probably *A. Celebensis*, Quoy, Voy. de l'Astr. pl. 57. fig. 1–4.

34. Natica maculosa, Lam. *pellis-tigrina*, Chem.

35. Novaculina olivacea, nobis. *N. testâ oblongâ, valdè inæquilaterali, epidermide olivaceâ, ad extremitates fuscescente, indutâ; natibus erosis; anterius rotundatâ, posterius angulato-rotundatâ; margine superiore ferè recto, posticè paululum descendente, ventrali medio subcompresso; intus albâ, dentibus lamellatis duobus recurvatis in utrâque valvâ, posteriore bifido.*

Long. $\frac{9}{10}$; lat. $3\frac{3}{10}$ unc.

A large example of this species, in the Collection of H. Cuming, Esq., exhibits a character which will probably be found generic; namely, a shelly protuberance in each valve, attached to the interior ligament at nearly its hinder extremity. These shelly substances have not, that I am aware, hitherto been noticed. It is probable that they become detached in most specimens by the removal of the animal.

36. Cyrena triangularis, nobis. *C. testâ trigonâ, solidiusculâ, epidermide fusco-virescente, transversim striatâ, striis marginalibus lateralibusque eminentioribus, sulco ab umbone ad marginem posteriorem leviter impressâ; margine antico descendente, vix excavato, angulo anteriore rotundato; margine superiore subrotundato, posticè ferè biangulato, propter sulcum dorsalem subsinuato; intus lacteâ, margine continuo nitentiore; dentibus cardinalibus in utrâque valvâ tribus, duobus bifidis; dentibus lateralibus brevibus, tenuissimè rugosis, haud striatis.*

Long. 3; lat. $3\frac{1}{10}$; alt. $1\frac{8}{10}$ unc.

The characters of this shell bear some resemblance to *C. Sumatrensis*, Sow. Gen.; but on comparison with the type of that species, now in the Cabinet of Sylvanus Hanley, Esq., the present is found to differ materially, in its triangular outline, as well as in the characteristic furrow from the umbo to the posterior margin, affecting the curvature of the posterior angle, and producing a slight sinuosity in the margin.

37. Unio. 38. Unio.

I am unwilling to describe as new these two species of the genus *Unio*, from want of acquaintance with the great American collections of the genus.

Although no letter accompanied this box of shells, Mr. Hamilton presumes that they have been sent to him by his friend Sir J. Brooke, Rajah of Sarawak. The remittance is undoubtedly from Borneo.

BOTANICAL SOCIETY OF EDINBURGH.

November 11, 1852.—Dr. Seller, President, in the Chair.

Various donations were announced to the Society's Library and Herbarium.

Professor Balfour exhibited a beautiful map, by James Lynam, Esq., titled "The Climates of the Earth, their characteristic vegetation, and the zones of the cultivation of useful plants, as limited by altitude and latitude, shown in the elevation of the principal mountains of Europe, Asia, and America, accurately laid down by scale from the writings of Humboldt, Meyen, Boissier, Hooker, Watson, &c."

Professor Balfour exhibited specimens of *Lastrea cristata*, and var. *uliginosa*, *Lastrea spinulosa* and *Polystichum angulare*, and made some observations regarding them.

The following papers were read:—

1. "On the Development of Tubular Structure in Plants," by R. Hobson, M.D. Cantab. Communicated by Dr. Balfour.

The object of this paper was to show the mode in which tubular structure is formed by the aggregation of cells in a linear series and the subsequent absorption of the partition-walls. The structure selected for observation was the moniliform hair found on the claw of the spurred petal of *Viola tricolor*. The author stated, that "If the structure of the tube is traced under the microscope from the root or base upwards, the lower part will be found fully formed (tubular), having gradually substituted a tubular for its previously cellular formation. A little higher up, absorption of the partition-walls (the united portion of the cells) is yet incomplete, being *in transitu* from cell into tube, whilst the remaining part is entirely cellular to the extreme point, which point is, in fact, a simple cell.

"There may be distinctly seen in a portion of this multicellular tube, near to its base, marks sufficient to prove that those points of the cells which have been primarily in union to form the tube have now been absorbed, or in some other way removed, and that this absorption or removal has taken place precisely in an equal degree from the centre of the different septa, or united portions of the cells, towards the periphery of the tube to the extent required to perfect nature's 'handiwork.' The marks to which I allude are triflingly apparent annular contractions."

The author made some observations, also, as to the time occupied in the formation of the tubes. He remarked:—

"In order to ascertain whether the mutation of cell into tube occupied much time, I instituted a comparison between the tubular portion of the hair on the full-blown flower, and that on the flower just opening, and found that the lower portion of the tube on the former (the full-blown flower) had generally become tubular to the amount of from eight to ten cells in each hair, which usually consisted of from twenty-five to thirty cells, whilst that of the latter (the opening flower) had become tubular only to the extent of about two or three cells. It therefore seems that the time occupied between the first opening of the flower and its fading period is sufficient to convert six or eight cells into tube, and it is probable that in the earlier part of the season during more genial weather, the fading stage would be delayed, and consequently that in proportion as the blooming period is prolonged, the length of the tubular formation would be increased; but it seems doubtful whether these tubes ever became tubular throughout their *entire* length.

"On the two contiguous petals on the inner and inferior part of each, on a prominence where the claw takes its origin, there is a ridge of hair of a totally different character from that on the claw of the spurred petal, being at all ages pervious *throughout,* dilating gradually from its base to within a trifle of its extremity, when it again gradually lessens in diameter, until it terminates almost spherically. There is not any second cell to be detected in any portion of *these* tubes, even before the flower opens; *their* origin and termination seem to be a simple cell, lengthening and dilating, and therefore they are clearly unicellular. In the multicellular tube, it is evident that in order to secure a *tubular* structure, nature clearly manifests her intention by generating a single linear series of cells, and that this multicellular tube shall be a *cone,* she as clearly manifests her determination by generating cells gradually decreasing in transverse diameter from the base to its apex; and it would seem that where she has completed her cellular arrangement as regards their position and formation, her subsequent care is, by some peculiar and amalgamating process, to unite the adjoining cell-walls into one compact septum, denominated a partition-wall.

"As regards this septum, it is not unreasonable to hope that repeated and minute microscopical investigations of the progressive growth and formation of the multicellular tube, at different periods of its age, may furnish material data on which to found a knowledge of the probable mode of its absorption or removal.

"To discover whether the comparative *increase* of growth of the opening and fading flower kept pace with cellular conversion into tube, I measured the transverse diameter of the tubular portions of the two stages of growth of a *cultivated* plant, and found that the average transverse tubular diameter of the hair of the *multicellular* tube of an ordinary full-blown flower in September was 1-1540th, whilst the tubular diameter of the opening flower was 1-2320th, giving an increase during the blooming period of 1-774th.

"The average of the tubular diameter of the unicellular tubes which had been exposed to light and air in the full-blown flower of the cultivated plant was 1-928th, whilst the tubular diameter in the opening flower was 1-1546th, giving an increase during the blooming period of 1-618th. On measuring the transverse diameter of the *multicellular* tube of the full-blown flower in its native state, I found it to be 1-3437th, whilst that in the opening flower was 1-2566th, giving an increase, during that portion of the blooming period, of 1-871th.

"The diameter of the unicellular tube of the wild flower, which was full blown, measured 1-182th, whilst that of the opening flower was 1-1370th, giving an increase of 1-688th."

2. "On the Cumberland forms of *Myosotis,*" by Mr. James B. Davies. In this paper, the author, after describing various forms of *Myosotis,* of which specimens and drawings were exhibited, called attention to the *Myosotis palustris* var. *strigulosa* (Reich.).

3. "On the Plants found in Cumberland in June 1852," by Mr. James B. Davies. The author gave an account of the species which he had found in the Lake district of Cumberland during the month of June.

December 9, 1852.—Professor Balfour, V.P., in the Chair.

The following gentlemen were elected office-bearers for the ensuing year:—

President.—Professor Balfour.
Secretary.—Dr. Greville.
Treasurer.—Mr. Evans.

Numerous donations were announced to the Society's Library and Herbarium.

Dr. Balfour exhibited a series of alpine specimens transmitted by Mr. Backhouse, including a collection of Clova and Braemar *Hieracia*, which contained nearly every alpine form found among the mountains of that district. Mr. Backhouse hopes ere long to be able to write a paper minutely describing these, and in such a manner as to enable persons to identify each form or species. In mentioning forms he alludes of course to the apparently permanent forms which may prove true species. Of the whole *Hieracia* (50 or 60) Mr. Backhouse has growing specimens carefully named and numbered, and he means to record the results of cultivation.

The following communications were made to the meeting:—

1. Dr. Balfour made some observations on the *Polypodium rhæticum*, Vill. Voyage Botan. p. 12, the *Polypodium alpestre*, Hoppe, and *Pseudathyrium alpestre*, Newm.

A good specimen of the plant is found in Mougeot and Nestler's 'Stirpes Cryptogamæ Vogeso-Rhenanæ,' no. 602. The plant is said to grow "in summis Vogesorum præruptis herbidis." It is stated by Mr. H. C. Watson to have been gathered by him in the great corrie of Ben Aulder on the west side of Loch Ericht, Inverness-shire; also in 1844 in Caenlochen Glen. The plant resembles *Athyrium Filix-fœmina* so much as to have been passed over by many botanists, and it had been put by Mr. Watson among his specimens of that species. It has been found of late by several botanists in the Highlands of Scotland, especially in the Clova and Braemar district. On looking over the plants in his herbarium, Dr. Balfour found that it had been gathered on several occasions by himself and others and put along with specimens of *Athyrium Filix-fœmina*. Dr. Balfour exhibited from his herbarium the following specimens of the plant, which had also been carefully examined by Dr. Greville:—

1. From Ben Hope, Sutherlandshire, August 1827, Dr. Balfour; and 2. August 1833, Dr. Graham. 3. Glen Callater, August 1836, Dr. Gilbert M'Nab. 4. Caenlochen, Glen Isla, August 6, 1840, Dr. Balfour.

The following papers were read:—

2. "Remarks on the Distribution of Plants in Madeira," by John M'Laren, Esq.

Mr. M'Laren made some observations on the distribution of plants in Madeira, as compared with the flora of neighbouring countries. He remarked that the vegetation of Madeira might be said to consist of two distinct floras. One of these had a great analogy to the flora of Algiers and the south of Spain, and contained many species common to those countries and to the shores of the Canaries and Western Isles. This might be described as the flora of the cultivated region. It included the naturalized trees and shrubs of the south of Europe; and most of the agricultural and littoral weeds, which, from their identity with European and North African species, were supposed to have been introduced by the agency of man, or by other natural means. A few lowland species not yet known as habitants of the Mediterranean shores, but which belong to Mediterranean genera, and do not claim affinity with the native flora of the Atlantic islands, he also includes in the flora of the cultivated region. He next adverted to the native flora of the island, which he said was identical in character with that of the interior of the Canary Islands and the Azores. It was well marked by the predominance of ferns, both in respect of the number of species and the fertility of individual life. Laurels and evergreen trees, with the arborescent heath, characterize the mountain scenery and give their name to the island, Madeira signifying 'the land of woods.' *Compositæ, Ericaceæ, Labiatæ* and *Cruciferæ* are represented by more than the usual proportion of species; *Gramineæ* and *Leguminosæ* hold an average place; and there is a remarkable deficiency in species of *Rosaceæ* and *Cyperaceæ*.

Mr. M'Laren gave a table showing the proportion of species in the different natural orders for the two Phyto-Geographic regions here indicated, and entered into some details to show the relations of these regions to the flora of the Mediterranean and the Atlantic islands respectively.

3. "On certain Structures observed in *Pentas carnea*, Benth.," by Daniel Oliver, Esq. jun., of Newcastle.

This plant furnishes an interesting form of cellular tissue; it also presents singular interpetiolary processes, which seem to be of a glandular nature.

Those persons who are interested in cell-multiplication, the relation of the primordial utricle to the secondary deposits of the outer cell-membrane, and the nature of such deposits, will find this plant a useful addition to their means of prosecuting such inquiries.

The regular gamopetalous tubular corolla of *Pentas carnea* is about 1 inch in length at the time of flowering.

Surrounding the throat of the tube, and to about one-fourth the distance down it, to the base of the attachment of the short free filaments with the tissue of the corolla, is a dense collection of unicellular hairs directed upwards. These hairs are slightly broader about the middle of their length, tapering, with sometimes a rather undulating outline, to the distal extremity, and a little narrowed towards the base.

Scattered in the lower portion of the corolline tube are hairs of a different structure, consisting of a single series of several cells; these narrow from the base to the apex, and are similar in form and structure to the hairs of the petioles of the leaves and interpetiolary processes.

The corolline hairs are remarkable from their fibro-cellular character; the nature of the spiral fibrous deposit is, however, difficult to determine. A first glance, with a magnifying power of perhaps 200 or 300 diameters, discovers the appearance of a narrow fibre winding, in a spiral direction, up the inner wall of the cell, ascending to the right (as seen from its axis), and closely applied to the apparent outer cell-membrane, which has become in part absorbed. Numerous elongated and narrow slits or line-like markings occur throughout the spiral, but whether they are openings between the edges of an individual thread, or series of fibres, or analogous to the dots and slits of broken vascular tissue, it is not very easy to pronounce.

When examined in fluid, this fibrous deposit has the appearance either of a coil of irregular breadth, or of a plexus or branching arrangement of fibre, between the threads of which a line of division is perceptible: if a dried hair be placed under the microscope, we only see slits, narrow and rounded at the extremities, in the direction of the spiral ascent; these are probably an altered condition of the exceedingly fine separating lines, discovered in the fresh state. The portions of fibrous matter intervening between these openings are of very irregular breadth. The threads of the fibre vary from the 1-6000th to 1-9000th of an inch in breadth. After observation with my highest magnifying power, one of Powell and Lealand's excellent $\frac{1}{4}$-inch objectives, I am not prepared certainly to describe the true condition and arrangement of this secondary spiral deposit.

In a hair of the young corolla (the latter about the 1-6th of an inch in length), I observed the spiral arrangement pretty distinctly; in the younger stages the cuticle does not appear to have become absorbed to such an extent as in the matured cell, a double wall being perceptible towards the extremity of the hair.

The primordial utricle is readily separated from the cell-wall by the application of reagents. A solution of chloride of calcium produces this effect after a brief interval, the utricle becoming either almost destroyed, or a mere thread lying in the cell.

I have thought that I may have observed an alteration in the fibrous deposit, connected with the irregularly distributed convexities of the cell-wall, and which gives rise to the frequently somewhat sinuous outline of the hair, but I cannot certainly mention an instance. The spiral fibre, if such it be, is quite incapable of unrolling, at least in the cases which I have examined, and the wall of the hair tears in a manner almost totally irrespective of its direction.

Series of spiral vessels, sometimes branching, are met with in the corolla, but I do not discover any direct communication between these vessels and the spiral cells.

I have not detected any movement of the cell-sap in this tissue; merely at times a slight molecular motion.

With regard to the multicellular hairs, these are readily obtained from any portion of the young exposed plant, but the curious filiform processes from the petiolary sheath furnish them without trouble in a condition easily prepared for examination.

The hairs consist of a variable number of cells, sometimes as many as nineteen, applied by their extremities. They almost invariably present more or less the appearance of dots, or rather slits, generally in a direction somewhat parallel with the axis of the hair, but sometimes also slightly inclined in a spiral (as in the unicellular hairs of the corolla), ascending to the right, as viewed from the centre. The edge of the lower portion of these hairs sometimes presents an almost even outline, but frequently (and perhaps nearly always towards the extremity of the hair) a slight irregular beading occurs, exactly as we might expect, were the dots or markings occasioned by external matter; but I am not sure that this appearance is incompatible with the idea that they may be openings or slits in a secondary deposit on the common wall of the hair, which, from an examination, solely of the markings in the central portions, we might conclude they were. I have not detected in these hairs actual motion of the cell-sap, but mucilaginous threads may be easily seen radiating irregularly from the nuclear vesicle, indicating such a circulation. With regard to the contents of the nucleus I cannot certainly speak. Sulphuric acid diluted, causes the primordial utricle to contract and lie in the interior as a loose sac; in some small cells the separation is not apparent after twenty-four hours' action.

A solution of chloride of calcium causes a partial dissolution of the primordial utricle, certain bodies, perhaps including the true nucleus, remaining visible.

The epidermis of the intervenal spaces of the under side of the leaf consists of cells with a sinuous boundary, numerous stomata formed by two crescentic cells applied by their extremities being scattered about,

Acicular raphides are of frequent occurrence; they abound also in the glandular stipules found between the petioles of the opposite leaves.

The application of pressure causes the escape of very numerous raphides, together with a peculiar thick fluid. In some instances this substance has a vermiform appearance when forced out of the enclosing sac, owing to its having been exuded, I suppose, through a small orifice.

MISCELLANEOUS.

On the Coccidæ *of the Olive, Orange, Lemon, and Rose-bay, and on the Maladies produced by them on those trees in the Province of Nice and in the Department of the Var.* By M. Robineau-Desvoidy.

The author proceeded to the South of France with the view of ascertaining the cause of a malady which had long been prevalent on the above trees in that part of the country, and which it was supposed had made its appearance in the central and northern departments.

This disease, called *morfée* by the Italians, *fumagine* in the North of France, consists in a thick, black crust which covers the trunks, branches, &c. of trees, sometimes over a considerable extent of country. The trees become arrested in their growth, languid and barren.

According to historical accounts, this disease has not appeared